

R21a Dynamical Implication of Circular Velocity Curves of Galaxies

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Kalinova et al. 2017 (MNRAS, 469, 2539) derived circular velocity curves (CVC) for 238 galaxies from late- through early-type galaxies using integral-field spectroscopic data from CALIFA survey. They analyze the stellar kinematic fields of galaxies, fitting Jeans Axisymmetric Models and applying Markov-Chain Monte-Carlo method. The CVC profiles were classified through Principal Component Analysis and a clustering technique into 4 classes according to the two dominant components, regulating the amplitude and the inner-rise steepness of the profiles.

In the present work, we introduce quantitative parameters representing these profile characteristics and explore their relations to other galaxy parameters in a sequential manner, to obtain insights about the dynamical changes from low-mass to high-mass galaxies in a framework of merging-evolution scenario in Lambda-CDM universe.

All the present studies support a picture that the increasing mass-concentration in the inner part of a galaxy stellar system suddenly undergoes a dynamical structure change and produces an active massive nucleus which disperses angular-momentum-rich baryon to quench star-formation process.